DHCP and Router Advertisement Options for Encrypted DNS Discovery

https://tools.ietf.org/html/draft-btw-add-home

January 2021

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Overall Approach

- Rely upon existing mechanisms to distribute DNS server information: DHCP, DHCPv6, and RA

- Typical communication flow
  - Clients ask for one or more encrypted DNS (e.g., DoT, DoH) by ***setting dedicated flags*** in the options
  - Servers reply with ADN(s), a list of IP addresses, and a port number, if the requested encrypted DNS is supported
    - It is ***RECOMMENDED to return both an ADN + a list of IP addresses***
    - ***One or more*** encrypted DNS types may be returned
    - These services may listen on the ***same or distinct IP addresses***
    - ***Alternate port numbers*** can be returned when default port number are not in use
    - If a list of IP addresses is returned, that list is ***ordered***
    - Some recommendations to ***optimize*** the message size are included

Main Changes Since IETF#108

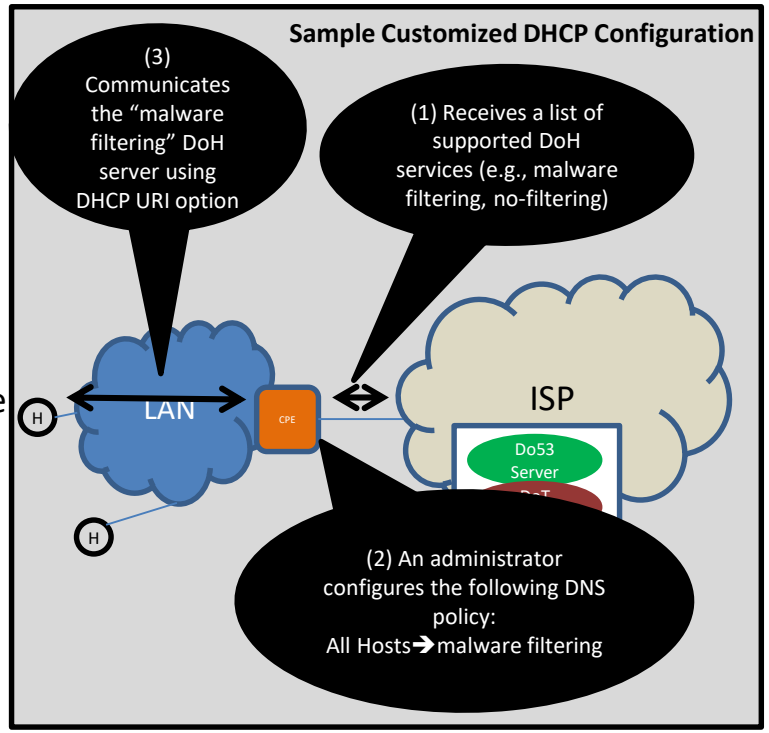
- Return a list of IP addresses instead of relying upon legacy DNS options
  - This is to ***avoid probing***
  - Useful if available encrypted DNS services are not available on the same IP address(es)

- ***Generalize*** the specification so that the options are not tied with a particular deployment

- ***Clarify*** the relationship with DEER

Question #1: URI Templates in RA/DHCP?

- Why?
  - Provide a customized DNS configuration within a local network
- There are trade-offs
  - Some issues
    - Create a ***dependency*** between DHCP servers (access routers) and DoH resolvers
    - May ***increase the size*** of RA/DHCP messages
  - Some advantages
    - Fills a void as there is ***no standard*** means to retrieve the URI information from the DoH server
    - Clients can ***immediately use*** the service(s); no need for extra queries to retrieve the URIs
    - Avoids Do53 lookups
    - Does ***not interfere*** with DNS exchanges to "customize" the available services
    - It is not susceptible to ***external attacks***
    - Avoids the client to fallback to SUDN (opportunistic encryption)



Suggestions:

- Define RA/DHCP options to convey URI Templates
- These options, when available, take precedence over DEER

Question #2: No @List is Returned

- If the client receives a Do53 @List and an ADN, should the client use that list to resolve the ADN or should that list be assumed as locators of the encrypted DNS?

Suggestion:
- Recommend to always return a list of @es, unless Do53 and encrypted DNS terminate on the same @es

Motivation:
- Optimize the message size

Next Steps

- Consider adopting this document as a WG item

- Questions?